

Decadal Challenges for Predicting and Controlling Materials Performance in

Extremes

FINAL



December 6-10, 2009
Bishop's Lodge, Santa Fe NM

Sunday, December 6, 2009

5:30-7:00 PM	Registration and Reception @ Tesuque Pavillion Portal)
(5:30 PM	Panel Chairs Working Dinner @ Las Fuentes Alcove Room)

Evening Plenary Session – MaRIE Introduction **Tesuque A and B**

7:00-7:10PM	Welcome	John Sarrao
7:10-8:00PM	MaRIE overview	John Sarrao
8:00-9:00 PM	Reports from prior MaRIE workshops (4 x 10 minutes each)	
	“Research Frontiers and Capability Gaps for Controlling and Designing Functional Materials January 20-22, 2009”	Mark McCleskey
	“Structural Materials Under Extreme Conditions July 29-31, 2009”	Dave Teter
	“Opportunities for Examination of Activated Materials by Synchrotron X-Rays and Neutrons September 20-22, 2009”	Mark Bourke
	“21 st Century Needs and Challenges of Compression Science September 22-24, 2009”	Dave Funk

Monday December 7, 2009
Tesuque A and B

7:45 AM	Continental Breakfast @ Tesuque Pavillion Portal	
8:15 AM	Welcome	Terry Wallace
8:20 AM	Workshop Charge and Overview	John Sarrao



Plenary Session – Mission Needs for Extreme Materials
Tesuque A and B

8:50 AM	Materials challenges for renewable energy	George Crabtree, ANL
9:30 AM	Materials challenges for fission energy	Stuart Maloy, LANL
10:10 AM	Break @ Tesuque Pavillion Portal	
10:30 AM	Materials challenges for fusion energy	Steve Zinkle, ORNL
11:10 AM	Materials challenges for nuclear weapons	Robert Hanrahan, NNSA
11:50 AM	Overview of Panel Structure/Vision	Panel Leads (in pairs)
	Radiation Matter interactions for Fission and Fusion Radiation Matter Interactions for Energy Conversion Matter Interactions in Extremes Cross-Cutting Themes	Steve Zinkle, Todd Allen George Crabtree, Paul Follansbee Roger Falcone, Malcolm McMahon Tony Rollett, Richard LeSar
12:15	Lunch @ Las Fuentes Main Room	

Breakout Session #1 (8 parallel rooms)- Initial Discussions

1:45 PM	Initial Panel Breakout Discussions Presentation of each participant's materials (5 min per participant)	
	Extreme Environment Tolerant Materials by Design Watching Damage Happen Materials Discovery and Processing for Advanced Functionality Making Every Photon Count Process Aware Material Certification in Extremes When Solids Stop Being Solids Enabling the Transition from Observation to Control Bridging Multiple Scales in Space and Time	Thunderbird 1 Thunderbird 2&3 El Charro Tesuque Pavillion C Las Fuentes Fiesta Las Fuentes Alcove Skylight North Lodge Room 174
3:30 PM	Break @ Tesuque Pavillion Portal	
4:00PM	Continue breakout discussions and generate first round of synthesis	
5:30PM	End of Day One Discussions	
(5:30 pm	Panel Chairs meeting – status/issues @ Thunderbird 1)	



Tuesday, December 8, 2009

8:00 AM Continental Breakfast @ **Tesuque Pavillion Portal**

Breakout Session #2 (8 parallel rooms)- Distillation of Panel Input

8:30 AM Continue Breakout Discussions in 8 panel rooms
Same rooms as Monday afternoon breakout session #1

10:00 AM Break @ **Tesuque Pavillion Portal**

10:15 AM Continue Breakout Discussions

11:30AM Lunch @ **Las Fuentes Main Room**

Plenary Session – Initial Panel Reports
Tesuque A and B

12:30 – 2:00PM Initial panel output highlighting draft priority research directions and capability gaps (10 minutes each) Panel Leads

Extreme Environment Tolerant Materials by Design	Todd Allen
Watching Damage Happen	Steve Zinkle
Materials Discovery and Processing for Advanced Functionality	Paul Follansbee
Making Every Photon Count	George Crabtree
Process Aware Material Certification in Extremes	Malcolm McMahon
When Solids Stop Being Solids	Roger Falcone
Enabling the Transition from Observation to Control	Tony Rollett
Bridging Multiple Scales in Space and Time	Richard LeSar

2:00 PM Break @ **Tesuque Pavillion Portal**

Breakout Session #3 (4 parallel rooms)- Integration of Panel Input

2:30-5:00 PM Combine panels into 4 breakouts
 (collapsing two panels in each major topical area)

Radiation Matter interactions for Fission and Fusion (Panels 1 &2)	Thunderbird 2&3
Radiation Matter Interactions for Energy Conversion (Panels 3&4)	Tesuque Pavillion C
Matter Interactions in Extremes (Panels 5&6)	Fiesta & Alcove
Cross-Cutting Themes (Panels 7&8)	Thunderbird 1

(5:30 PM Panel Chairs meeting – status/issues @ **Thunderbird 1**)

6:30 PM Informal Discussion / Reception @ **Thunderbird and El Charro**



7:30 PM Banquet Dinner @ **Thunderbird and El Charro**

“Prospects for a Comprehensive Test Ban Treaty and National Security Implications, “, Terry Wallace , Principal Associate Director for Science, Technology and Engineering, Los Alamos National Laboratory

Wednesday December 9, 2009

8:00 AM Continental Breakfast @ **Tesuque Pavillion Portal**

Breakout Session #4 (4 parallel rooms)- Final Report Preparation

8:30AM Combined 4-panel breakouts prepare outbrief presentations/dry runs
Same rooms as Tuesday afternoon breakout session #3

12:00 PM Lunch @ **Las Fuentes Main Room**

**Plenary Session – Final Panel Reports & Crosscutting Considerations
Tesuque A and B**

1:00 -3:00 PM 30 min presentations by each of 4 combined panels

Radiation Matter interactions for Fission and Fusion	Steve Zinkle, Todd Allen
Radiation Matter Interactions for Energy Conversion	George Crabtree, Paul Follansbee
Matter Interactions in Extremes	Roger Falcone, Malcolm McMahon
Cross-Cutting Themes	Tony Rollett, Richard LeSar

3:00 PM Break @ **Tesuque Pavillion Portal**

3:30PM Wrap Up: Crosscutting Themes/Emergent Issues John Sarrao

5:00 PM **Workshop adjourns**

Thursday, December 10, 2009
Las Fuentes Fiesta Room

Executive Session: Report Writing (Core Writing Team Only)

8:00AM Continental Breakfast

8:30 AM Panel Chairs and Core writing team draft reports (5-7 pages from each)

12:00 PM Core Writing Team Adjourns